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ABSTRACT

This guide is intended for use by vocational instructors wishing to integrate environmental science concepts and vocational skills in their high school classrooms. The first section recounts the process of developing an integrated environmental science-vocational education program at Sandy Union High School in Sandy, Oregon. Planning a combined program is the subject of the second section, which explains the processes involved in the following four program planning steps: conducting a survey, brainstorming with teachers, zeroing in on a "combined course," and surveying students. Criteria for selecting teachers are discussed next. The importance of selecting teachers who (1) can be flexible, (2) are compatible with teachers who are not from their own discipline, (3) have solid backgrounds in their own field, and (4) are student-directed in the sense that they consider student outcomes to be central to instruction, is one of the keys to success. A section on overseeing the program stresses the crucial nature of community support and explains the advantages of having a program advisory committee. Guidelines for assessing the program's success are presented. A sample completed topic analysis, breakdowns of the science and vocational skills addressed in the student/project goals, and a sample environmental science questionnaire and student profile instrument are included. (MN)

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A STEP-BY-STEP GUIDE TO INTEGRATING SCIENCE CONCEPTS AND VOCATIONAL SKILLS IN THE HIGH SCHOOL CLASSROOM:

THE SANDY UNION HIGH SCHOOL EXPERIENCE

CE 049 846

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INTRODUCTION

"They are challenging education to produce scientifically literate students who will be able to function in the labor force."

In March 1985, the Oregon Department of Education awarded Sandy Union High School a Vocational Grant-in-Aid to develop a model for integrating science and vocational skills in the high school classroom. The goal was to encourage cooperation among vocational and science teachers, who often cover similar concepts and skills in the courses they teach.

In making the award, the Department noted, "Many employers from business, industry, and government are openly critical of the inability of graduates to relate to and apply scientific principles to their work. They are challenging education to produce scientifically literate students who will be able to function in the labor force."

Any high school that wishes to meet this challenge will do well to follow a deceptively simple, but vital, process to:

1. Decide if the school **wants** to develop a combined program of science and vocational education.
2. Determine what that program should be.
3. Involve faculty, students, parents, and administrators in the decision-making process.
4. Evaluate the program's success.

Along the way, the school will want to consider how science instruction might relate to students' career plans — how theoretical ideas relate to practical tasks — how students can develop self-confidence in their ability to learn and apply scientific principles. The challenge for both science and vocational instructors becomes one of continually reinforcing the importance and usefulness of science in the everyday lives of students and adults.

At Sandy High School, we followed these steps carefully, recording the process we used and developing a number of forms that we believed might prove useful to other schools. The results of our work are offered here in the hope that other districts will see the value of adopting a combined program of science and vocational education and will find the "going" a bit easier because of the groundwork we have laid.

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Profile Of The Sandy High School Experience

At Sandy High School, we have developed a "combined" science/vocational education course entitled Environmental Science. Our classroom: a 40-acre woodland nature preserve that abuts the campus and is owned by the school. The course centers on four instructional goals that clearly combine concepts and skills in both subject-matter areas:

1. Students will construct a multi-use trail system throughout the preserve.
2. Students will redesign an existing pond and watershed.
3. Students will construct salmonoid egg hatching boxes and establish a migratory fish run in a local stream.
4. Students will improve stream habitat for local wildlife.

This course is the culmination of the decision-making process described later in this booklet. It is a course which students enjoy and of which we are extremely proud. It is a very special course that meets the goals of our Oregon Department of Education grant, fulfills State guidelines in science and vocational education, and makes use of a unique campus asset. More than that, the woodland preserve — as improved by the students in the course — has become the focal point of instruction in subjects, such as English and physical education, that lie **outside** the science and vocational curriculum. It has even become a resource to the community and a public relations coup for the school.

Environmental Science has as its classroom a pristine, peaceful forest that lies within the city limits of Sandy, one-half mile from a major highway and a McDonald's Restaurant. When the course began, there were no trails through the forest, nor any indication of where a trail might go. That would be up to the students.

For all practical purposes, Environmental Science is "team taught" by two instructors who saw its potential to touch virtually every life in the school and community.

For all practical purposes, Environmental Science is "team taught" by two instructors who saw its potential to touch virtually every life in the school and community. However, Zel Gernhart, head of the science and mathematics program, and Randy Hutchinson, in charge of health and physical education, never saw the course as being theirs alone. Rather, they developed it with the help of teachers in 11 other classes, who were prepared to involve those classes in the work of the Environmental Science program whenever that seemed appropriate.

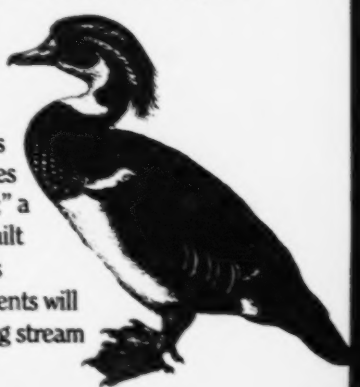
Now, thanks to the efforts of dozens of teachers and students, the forest has over a mile of all-weather cedar bark trails, which are regularly used for cross-country training and private jogging; a fitness course, designed and built by students in several different classes; two ponds, also designed and built by these students and stocked by them with trout and steelhead; bridges designed by drafting, woodworking, and metals classes; and signs provided by the same classes to welcome community members, who use the forest for recreation and "renewal."

Students in drafting helped lay out the trail and made sketches for the bridges. Forestry students also helped influence the layout of the trail by assessing the topography of the entire area and identifying plant and animal species. These same forestry classes were able to see firsthand the importance — in good timber management — of thinning trees. In the process, they discovered one huge old-growth Douglas fir. To estimate its age, they invited a timber expert to speak to their class.

Biology, botany, and zoology students discovered that the woodland preserve is a natural place to hunt for insects and to study plants, fungi, and trees, to say nothing of wildlife. So far, they have observed — or seen signs of — deer, bear, raccoon, opossum, marmot, and hundreds of bird species, including quail, pheasants, mallard ducks, Canadian geese, great blue herons, and wood ducks. Woodworking classes have been called on to build nesting boxes for the wood ducks.

More recently the metals class has been brought in to design and construct the overflow pipe from the upper to the lower pond. And the course coordinators have begun to work closely with the agriculture program, which has fields and a barn on the edge of the forest. Now, English teachers send their students to the nature preserve to write, and it is likely that photography and art teachers will follow suit.

All of this has been accomplished in two years, but there are educational goals ahead that will take at least three years to accomplish. Biology and botany classes will identify trees and plants, which woodworking and metals classes will mark with specially designed plaques; benches will be provided by vocational classes to invite hikers to "invite their souls;" a dock for the handicapped will be built on the upper pond, and the school's canoeing class will meet there; students will look into the possibility of improving stream



habitat outside — as well as inside — the preserve; and ways will be found to make the forest safe and enjoyable for the elderly of the community. There are even plans to construct a pioneer village on the edge of the forest for the enjoyment of summer tourists — and in the process to provide employment for some of Sandy's students.

In two years, Sandy Union High School has come a long way toward integrating its science and vocational courses. The process has been a fluid one, with teachers in a wide range of subjects being willing to involve their students as often as the work of the Environmental Science course requires. This does not mean, however, that the course has been loosely planned. In the beginning, course goals were set carefully and areas in which instruction in 12 courses overlap were plotted in detail.

The next section describes the decision-making, planning process that made a combined science/vocational program possible.

Planning A Combined Program

The key to developing an integrated program of science and vocational education is to identify possibilities within the existing curriculum and find staff members who can shape the "new" curriculum from the "old." Any new, combined course should be based on existing course descriptions, goals, objectives, lesson plans, teaching strategies, and resources. The Oregon State Minimum Standards require districts to maintain planned course statements on each course in their educational programs. These statements contain course goals and objectives. When the science and vocational planned course statements are examined, learning activities can be extrapolated, usually from the teachers' own lesson plans on file with the school or — more commonly — from a scope and sequence for the individual class filed in the Curriculum Office.

Step 1: Conducting a Survey. At Sandy, we began our program by conducting a survey of science and vocational education teachers to answer the following questions:

- What science and vocational programs could be combined in a single integrated program?
- How would a combined program be structured?
- How would teachers be selected?
- How would occupational roles and tasks be integrated?

Questions were framed on a single 8½ x 11" sheet of paper, leaving plenty of space for answers.

Step 2: Brainstorming With Teachers. The teachers who responded to the survey displayed a great deal of enthusiasm for an integrated science/vocational program. As soon as we had made a preliminary tally of the their responses,

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therefore, we invited these same teachers to attend a "brainstorming" session to indentify the skills and concepts that both curriculum areas have in common. The two-day session was led by our District Superintendent, the staff member we considered best able to keep participants "on task."

She began the session by asking teachers to identify ***topics*** taught in both vocational and science courses. In response, teachers listed a variety of concepts, processes, skills, and attitudes. The following items were suggested as sample concepts for possible integration:

> measurement, fusion, structural strength, chemical production, axial rotation, electricity, and heat transfer.

In the spirit of good brainstorming, we did not begin our session by trying to control discussion or by commenting negatively on the topics teachers felt might be suitable for a combined program. Later, however, we found that broad topics — such as the concept of "heat transfer" — had the potential for generating dozens of collaborative activities, while narrower topics — such as the concept of "retrograde motion" — were less versatile.

Once we had generated lists of topics, it was time to indentify **all** the courses in which they were taught. This exercise, like the intial brainstorming, was a large-group exercise. We found that this task provoked considerable discussion — sometimes even argument — among the subject-matter experts we had assembled. However, we also found it a good practice to let feedback continue as long as possible and to tape record it, since later on it would help greatly in generating specific activities for the new combined science/vocational course.

Next, we asked the large group to identify the types of ***strategies*** they use to teach topics identified earlier in the process. Here, science and vocational teachers found their instructional strategies similar, and we emphasized that this would be very helpful to them as they developed joint courses.

Strategies that emerged from our discussion included small-group discussion, with a media presentation at the beginning of the period; concept attainment (from Bruce Joyce's *Models of Teaching*), in which the instructor requires students to choose among several examples; formal lecture, followed by a question-and-answer session; and scientific investigation, in which all the students focus on a single problem.

Next, we described to teachers the most important component of our analytical process, which involved identifying the ways in which students will ***demonstrate*** their knowledge of the subject at hand. Although we discussed a few examples with the large group, this analysis would primarily be conducted later on, when teachers formed small groups to further analyze the process of planning and teaching specific topics for an integrated curriculum.

We also briefly described and illustrated the last phase of the brainstorming process — identifying resources (e.g., film, reference, textbook, transparency) that should be used to cover each topic and to plan each lesson.

During the second half of our meeting, we reviewed the topics identified earlier as being taught in both science and vocational classes and discussed which topics seemed to lend themselves to combined programs. These "selected" topics were then prioritized.

Next, we divided the large group of teachers into "triads," assigning both science and vocational teachers to each. Before moving into small groups, we distributed forms, which we called ***Topic Integration Analysis Forms*** and "walked" the group through the process of filling out one form. The task of the triads would be to complete one form for each of several topics assigned to them from among the complete list of topics discussed by the large group.

Each triad would begin by discussing the highest priority topic. Each would:

1. identify the science and vocational classes in which the topic is currently taught,
2. describe the strategy for teaching the topic,
3. explain how students would demonstrate mastery of the material taught, and
4. list resources to be used by students and teachers.

Teachers were asked to complete each form within a predetermined period of time (15 minutes), the overall goal being to explore all potential vocational and science relationships during the remainder of the brainstorming session.

The purpose of this process is to define, in very specific terms, a number of areas in which science and vocational instruction might be combined. The process itself generates enthusiasm among teachers, who begin to see numerous possibilities for cooperation later on.

Step 3: Zeroing in on a "Combined Course." Once brainstorming is completed, a review of the results will reveal a rich array of possibilities for science/vocational education collaboration. At this point it is necessary to select one or two possibilities that offer the best chance of success.

Earlier, brainstorming had encompassed the broad picture so that several approaches and strategies for unifying the two areas of instruction were introduced. Now, unifying topics needed to be identified and key objectives established for those selected.

To complete this task, a small group of science and vocational education teachers was later selected. At this point, decisions were made about the "practicality" of combining programs, about learner outcomes, about State and District teaching requirements, about class location, about the right combination of teachers.

(The teachers ultimately selected for the combined program are crucial to its success. Not only should they express great interest and motivation; the teaching pairs or teams should have good rapport and be willing to offer mutual support. Quality of instruction is directly related to the enthusiasm and energy of the instructors themselves. The topic of teacher selection is discussed on page 4.)

The first task of the small planning group is to review ***Planned Course Statements*** for all current science and vocational classes and ***Topic Integration Analysis Forms*** from the brainstorming session to determine where the greatest potential for combining instruction lies. This is a matter of seeing where existing goals, objectives, and instructional content match most closely.

In our case, a biology class using our 25-acre nature preserve as a classroom seemed to offer the greatest potential for including components currently taught in vocational classes. Further, it seemed appropriate to base a combined science/vocational course on the four goals of the existing course which was called "Sportmen's Biology."

To make our work at this stage easier, we used an ***Integrated Analysis Grid,*** which we had developed, to display, on a single page, **all** of the courses in which a relevant concept, skill, or attitude was taught. By noting on the grid those courses in which a topic was ***introduced, taught, or reinforced,*** we could determine which current courses covered that topic most thoroughly.

On this grid we also noted the ***career areas*** to which instruction in a particular topic related. This form also allowed us to make sure that the ***concepts taught*** related to State guidelines (*A Framework for Science Programs*, Oregon Department of Education, 1979) and to standard guides to career planning (such as *The School Subject Occupational Index*, McKnight Publishing Company, 1979, and the *Guide for Occupational Exploration*, U.S. Employment Service, 1979).

The grid is a useful tool because it allows one to visualize relationships among science and vocational classes and those common elements they treat. Also, the activities developed earlier can now be numbered and cross referenced to the grid by marking the far right column. Should the activity be consistent with either a goal, concept, or task cited on the left-hand column of the grid, it can be easily referenced (see Figure 2).

To further analyze careers to which a given course relates, a refined version of the grid (Figure 3) can be used.

Step 4: Surveying Students. Before the environmental science project was assembled, one other preliminary task was completed. A student questionnaire (Figure 4) was circulated among the classes identified as components of the project.

SELECTING TEACHERS

Perhaps the most important key to success of an integrated program is the selection of a teaching staff. This process requires careful, methodical planning and should not be rushed or entered into haphazardly. Several steps should be thoroughly followed, with appropriate decision making occurring at each. First, the vocational and science staffs should be surveyed

Perhaps the most important key to the success of an integrated program is the selection of the teaching staff.

to determine which members have interest in either team teaching across departmental lines or in collaborating on writing curriculum. Both jobs need to be performed and require cooperative decision making.

Second, teachers who respond favorably should be interviewed. Usually the vocational and science department chairpeople are the best candidates to carry out this assignment, aided perhaps by another administrator. This team of three should build questions that deal specifically with the instructor's attitude about an integrated program. Without support from the teachers themselves, a combined vocational/academic program is going to fail. Interviewers should especially be alert to any hint that prospective instructors for the program are wedded to their earlier teaching practices. Teachers who exhibit concern about having these practices changed or their subject areas diluted will probably not be able to commit to the spirit of an integrated program.

Third, once teachers have been identified and placed in a selection pool, several additional criteria should be implemented.

Criterion 1: The teachers ultimately selected for participation should be *flexible.* When a vocational program becomes integrated with science, the ability to adapt to new situations is crucial. Combining vocational curricula with academic disciplines requires radical new approaches to instruction. In the humanities programs implemented in recent years, concepts have been merged with concepts (concepts from art and English, psychology and history, etc.),

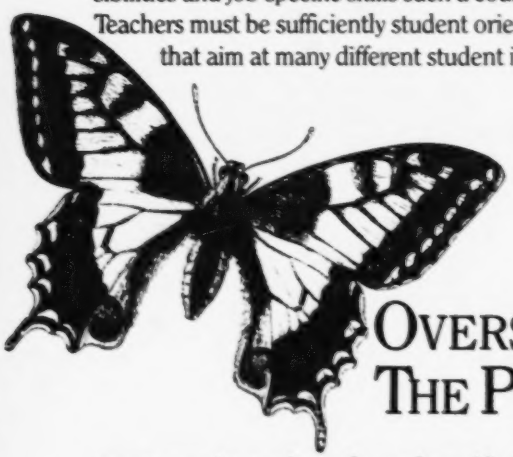
Combining vocational curricula with academic disciplines requires radical new approaches to instruction.

but few schools have integrated concepts with **skills**. The integrated program teacher has to be open to this idea. He or she must be willing to attempt new activities and to become distanced from routine, repetitive paper–and–pencil tasks.

Criterion 2: Because of their close working relationship, the science and vocational instructors must be *compatible*. If their personalities and work habits do not blend, these teachers will be at odds with one another and with themselves. Conflict is avoidable when teachers feel comfortable with one another and with the enterprise on which they are collaborating. Compatibility is not the easiest personal characteristic to determine, but by observing the interaction of teachers for several weeks, it is possible to gain some insight. If the teachers in question appear to be friendly, compatibility will probably not become an issue.

Criterion 3: The teachers selected should have *solid backgrounds* in their fields. They should be well read, up to date, and of course endorsed in their primary fields.

Criterion 4: Teachers recruited for an integrated program must *student directed* in the sense that they consider student outcomes to be central to instruction. When students are asked about their course-related job interests, it is likely that they will express a wide variety of expectations for the course. It is important that teachers address these expectations when writing course goals and learning activities. Indeed one advantage of combining vocational and science concepts is the range of employment possibilities and job-specific skills such a course opens up. Teachers must be sufficiently student oriented to make plans that aim at many different student interests and needs.



Overseeing The Program

To review project roles and provide input on program direction, an advisory committee should be established. The first advantage of such a committee is that it spreads interest in the project's success to community members and parents. With broad-based public support, a new, innovative educational effort has a better chance of succeeding. When the public is involved from the beginning, accountability questions — for example, "Is it fiscally sound?" "Are its goals consistent with basic education?" "Is it a watered-down curriculum?" — are more easily answered and less controversial. The committee can even be involved in brainstorming and certainly should be involved in all phases of program development.

The second advantage of an advisory group is that it provides the opportunity to involve experienced workers in fields addressed by the project, assuring that realistic applications of course content can be made to "the world of work." The school experience can replicate real life, and tasks assigned during the course can be made meaningful to students' selection and knowledge of careers. Though they are not curriculum writers, lay people can offer valuable insights about how topics can be integrated.

Community support is critical if programs are to flourish.

A third advantage of an advisory committee is the interest it promotes in attaining educational goals for the school. Community support is critical if programs are to flourish. Advisory committees are quasi-political bodies that can often enhance a curriculum innovation. They can, and often do, create resources to sustain projects for lengthy periods.

The committee should be comprised of four groups of people: citizens, teachers, business people and experienced workers in fields appropriate to the project, and students. Each group should have the same number of representatives, with the total of all groups ranging from 12 to 16.

The committee should meet at least once each academic term. The first meeting should acquaint members with the project and — if appropriate — include a tour of the project site. Handouts should be provided to specify goals and student activities.

Meetings should be confined to two hours, with one hour devoted to an open exchange of ideas and opinions about the project. The group should elect a community member as chairperson and another person as secretary. Minutes of the meetings should be presented to the district superintendent for possible administrative or board action.

The chairperson should make sure that meetings follow agendas and that discussion does not become sidetracked. The group's purpose is to support, reinforce, and improve the new program, not to set policy or evaluate personnel. Its level of commitment in large part determines the program's survival.

Evaluating Your Success

To assess a program combining science concepts and vocational skills, a district should conduct an internal evaluation, using a group consisting of advisory committee members, teachers, and students. The evaluation should occur in mid-year and again in June. After the possible mistakes of the first several months, a mid-year review will discover and correct problems before they become serious.

> Unless a practice or goal or course requirement can withstand later scrutiny, it doesn't belong in the project.

The evaluation should be considered at the moment the integrated program is designed. Unless a practice or goal or course requirement can withstand later scrutiny, it doesn't belong in the project. For example, if a newly established integrated program is designed as a two-year option for juniors, the feasibility of this idea should be assessed early on. Students and parents should be interviewed, scheduling conflicts resolved, and time commitments for both students and staff established before assuring juniors that they will be able to continue with the course when they are seniors.

The internal evaluation should also be reinforced by an independent third-party evaluation. Not only does this review shape the project's integrity, it assures that performance will not be permitted to lapse.

The collaborative program must meet the needs of the diverse student population it serves or it will simply become two courses of study, melded together, with little "partnering" of goals and learner outcomes. If the science concepts are established for one type of student, it would be only natural to devise the vocational components for the same student. However, this approach denies the philosophy behind integration. The contemporary marketplace demands that students be offered the science instruction that best enables them to cope with a rapidly changing technological world. Those changes affect students differently, depending on their career interests and vocational aptitudes. An integrated program must respond to a variety of needs.

An evaluation of the collaborative program should also focus on the degree to which it is activity based. When combining an academic discipline with a vocational area, the organizing principle is applicability — what learnings in science may be practiced in the world of work. The program should not occur in a static learning environment of textbook, discussion, and lecture. The instructional delivery system must be consistent with the course objectives. Students "practice" science — they inspect plant growth to learn about photosynthesis (agriculture); they identify insects injurious to trees (forestry); they examine the effects of certain chemicals on metallic surfaces (metals). The learning is applied or delivered through a series of activities, much as it is in the laboratory of a traditional science class. However, the "laboratory" for an integrated class may be wherever the vocational component leads the student and instructor. Evaluation should be keyed to this possibility.

Finally, evaluation should focus on both science concepts and vocational skills and demonstrate that one is not sacrificed for the other. The collaborative program may be self-destructing when any of its content becomes "watered down."

A Final Word

For Sandy High School, the attempt to integrate science and vocational instruction has been far more than a dispassionate experiment. Due in large part to the dedication of the faculty, the collaboration has forged bonds within the school and between the school and the community that can only grow stronger in the coming years. It is our hope that other schools will be inspired by our example to create equally satisfying integrated programs.

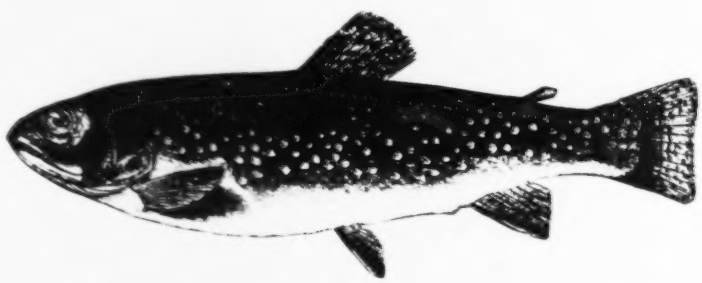


Figure 1

COMPLETED TOPIC INTEGRATION ANALYSIS

TOPIC: Population

SCIENCE CLASS	VOCATIONAL CLASS
Taught In: Biology/Environmental Science	Taught In: Agriculture II
Teaching Strategy: The instructor will lead a discussion of population. He will ask students to define the term and write responses on the chalkboard. After a "consensus" definition has been derived, discussion will focus on density, control factors, and interaction of species.	Teaching Strategy: The instructor will physically demonstrate the process of evaluating destructive insects in alfalfa. He will discuss each step and clarify all questions. He will then show students how to use an insect sweep.
Demonstration of Student Knowledge: Students will explore specific sites using the field collecting procedures defined by the instructor, and identify specific populations. In a written report, students will relate the populations to biotic and abiotic factors.	Demonstration of Student Knowledge: Students will use the insect sweep to collect injurious insects in an alfalfa field. A record will be compiled of the insects found. Specimens will be examined.
Resources: Line transect, hoop transect, written methods of random sampling, scat boards, netting, processes of live trapping.	Resources: Insect sweep.

Figure 2

STUDENT/PROJECT GOALS : The goal for which items below pertain would be written here.

I = Introduce (i.e., to bring topic or concept into use; to initiate discussion)

T = Teach (i.e., to provide systematic, formal instruction)

R = Reinforce (i.e., to strengthen instruction; to make the instruction more compelling)

	INTEGRATED COURSES												
	VOCATIONAL CLASSES					SCIENCE CLASSES							
	Intro to Agriculture/Hort	Forestry I & II	Wood I & II	Drafting I & II	Metals I & II	Unified Science I & II	Biology	Chemistry	Botany	Zoology	Physics	Environmental Science	Topic Integration Analysis
1. Concepts													
(a) Interaction (from A Framework for Science Programs)	I	IT							ITR		ITR		
2. Objectives													
(a) Students will be able to define population.	ITR	I				ITR					ITR	3*	
3. Tasks (learning activities)													
(a) Site Selection	R	R		ITR			R		R	R	IT		
(b) Trail Design	R	TR		ITR			R		R	R	IT		
4. Related Jobs													
(a) Environmental Analyst	ITR	ITR	R	R		R	ITR	R	ITR	TR	R	ITR	
(b) Geographer	TR	TR		TR		R	TR		R	R	R	ITR	

*3 This identifier number refers to a previously brainstormed activity (see Figure 1) which RELATES to the objective

Figure 3

STUDENT/PROJECT GOALS: Students will construct a multi-use trail system throughout an existing 25-acre woodland tract.

I = Introduce (i.e., to bring topic or concept into use; to initiate discussion)

T = Teach (i.e., to provide systematic, formal instruction)

R = Reinforce (i.e., to strengthen instruction; to make the instruction more compelling)

	INTEGRATED COURSES												
	VOCATIONAL SUBJECTS					SCIENCE SUBJECTS							
Related Jobs	Intro to Agriculture/Hort	Forestry I & II	Wood I & II	Drafting I & II	Metals I & II	Unified Science I & II	Biology	Chemistry	Botany	Zoology	Physics	Environmental Science	Topic Integration Analysis
Environmental Analyst	ITR	ITR	R	R		R	ITR	R	ITR	TR	R	ITR	*
Geologist	ITR	ITR		R	R	ITR	ITR	R	R	R	R	TR	
Geographer	TR	TR		TR		R	TR		R	R	R	ITR	
Botanist	ITR	ITR	I R	R		TR	ITR	R	ITR	R	R	ITR	
Horticulturist	ITR	ITR	R	R		R	ITR	R	ITR	TR	R	TR	
Zoologist	ITR	TR				ITR	ITR	R	R	ITR	R	TR	
Soil Conservationist	ITR	ITR		R	TR	ITR	ITR	R	TR		R	TR	
Forester	TR	ITR	R	R	TR	R	TR	R	ITR	R	R	ITR	
Farmer	ITR	ITR	R	R	ITR	R	ITR	TR	ITR	ITR	R	ITR	
Game Bird Farmer	ITR	TR	R	R	I R	R	TR		R	ITR	R	ITR	
Wildlife Control Agent	ITR	ITR	R	R	R	TR	ITR	R	ITR	ITR	R	ITR	

* Coded identifier number would be placed here referring to a completed topic integration analysis related to job of "Environmental Analyst."

NOTE: When "R" is the only letter in a cell, the line item is not part of the course curriculum but has been introduced and/or taught in another science or vocational class. The grid shows clearly where students will find the item within the school program. If, for example, a student in Woods I or II would like to be taught the requirements for "Environmental Analyst," he should take either Introduction to Agriculture, Forestry I or II, Biology, Botany and/or Environmental Science.

Figure 4

ENVIRONMENTAL SCIENCE QUESTIONNAIRE
AND STUDENT PROFILE

NAME _____

ADDRESS _____

YEAR IN SCHOOL _____

PHONE NUMBER _____

PARENT'S NAME _____

PARENT'S WORK NUMBER _____

DOCTOR _____

1. What is your primary purpose for enrolling in this class? _____

_____

_____

2. What do you hope to learn while enrolled in this class? _____

_____

_____

3. What special qualities do you possess that might help you do well in this class? SCIENCE _____

_____

VOCATIONAL _____

_____

4. What occupation do you intend to pursue after high school? _____

_____

_____

5. What do you hope you will gain from this class to help YOU meet your occupational goal? _____

_____

_____

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